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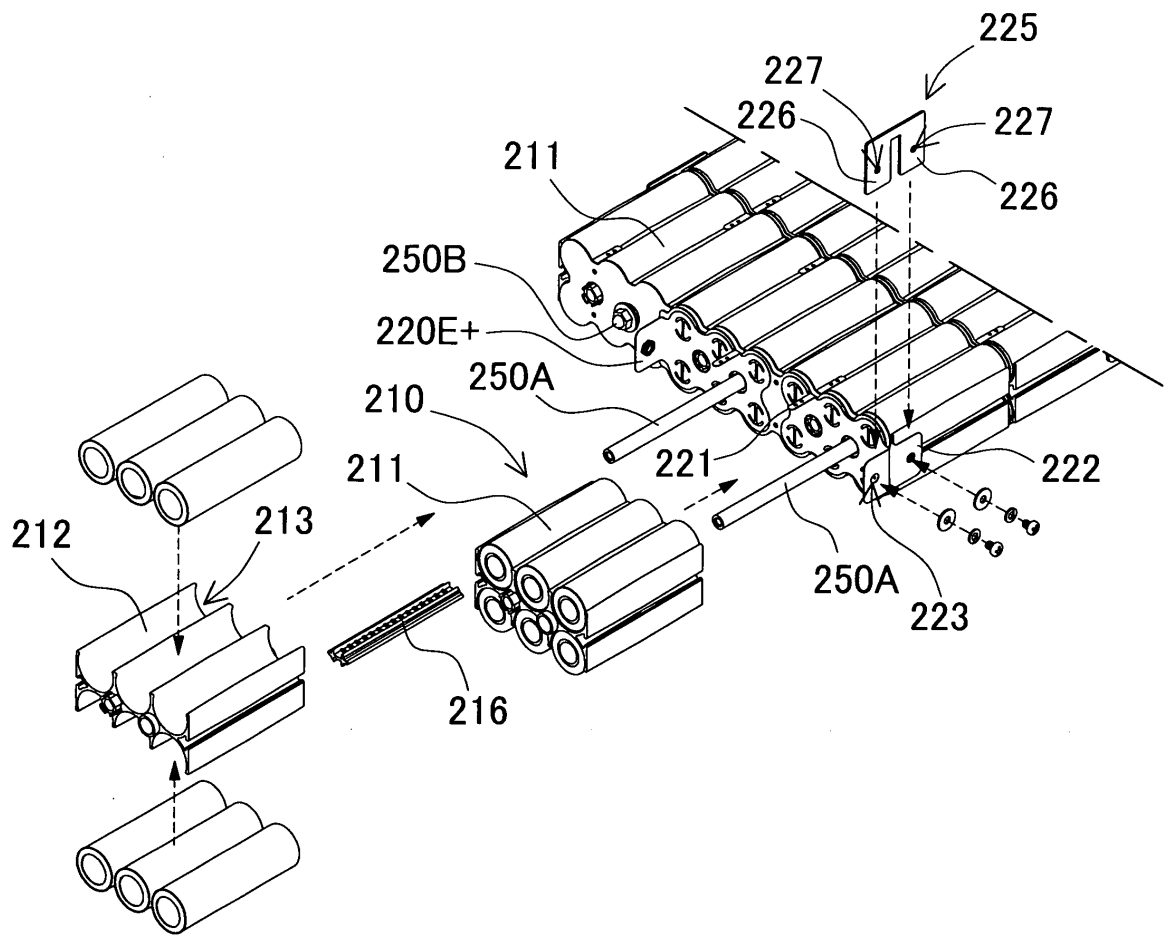
(54) **Battery pack**

(57) A battery pack comprises battery blocks 210 each of which includes base batteries 211 having a cylindrical exterior container, and a battery spacer 212 for holding said base batteries in parallel; pairs of lead plates 220 each of which connect the end surfaces of said base batteries 211 held by said battery spacer 212 so that the base batteries are connected to each other in parallel, and one of one pair of the lead plates 220 in one battery block is serially connected to one of one pair of the lead plates 220 in another battery block; a circuit board 240 that is electrically connected to said pairs of lead plates 220; and an exterior case 230 that accommodates said battery blocks 210 and the circuit board, wherein said battery blocks 210 are classified into battery block rows 202 in that the classified battery blocks are arranged side by side in parallel to each other so that the end surfaces of the base batteries 211 included in the battery blocks are arranged coplanar with each other, wherein said bat-

tery block rows 202 are arranged side by side so that the end surfaces of said base batteries 211 of said battery block rows are opposed to each other and so that said base batteries 211 of said battery block rows 202 are aligned in substantially straight lines and extend in the center axes of cylindrical shapes whereby composing a battery assembly 201, wherein battery block rows 202 that are arranged side by side include lead plate 220 extension parts extending along side surfaces of said battery assembly 201, and the battery pack comprises lead connection portions 225 that electrically connect the lead plate 220 extension parts to each other, wherein the lead connection portions 225 are alternately arranged on parts of the side surfaces of said battery assembly 201 between adjacent battery block rows 202 to connect said lead plates to each other.

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FIG. 23





EUROPEAN SEARCH REPORT

Application Number
EP 11 00 6293

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	JP 2008 034296 A (SANYO ELECTRIC CO) 14 February 2008 (2008-02-14) * abstract * * paragraph [0014] * * paragraph [0031] - paragraph [0032] * * paragraph [0035] - paragraph [0036] * * figures 3-7 *	1-9	INV. H01M2/04 H01M2/10 H01M2/20 H01M10/48 H01R9/00
A	JP 2008 198435 A (SANYO ELECTRIC CO) 28 August 2008 (2008-08-28) * abstract * * figures 3,4,8,11,12 *	1-9	
A	JP 2009 176689 A (SANYO ELECTRIC CO) 6 August 2009 (2009-08-06) * abstract * * figures 1-6 *	10-15	
A	US 2006/177734 A1 (YAO LI-HO [TW]) 10 August 2006 (2006-08-10) * the whole document *	10-15	
A	EP 1 313 156 A2 (NISSAN MOTOR [JP]) 21 May 2003 (2003-05-21) * the whole document *	10-15	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			H01M H01R
3	Place of search Munich	Date of completion of the search 24 April 2012	Examiner Horváth, László
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-9

A battery pack comprising: a plurality of battery blocks (210) each of which includes a plurality of base batteries (211) having a cylindrical exterior container, and a battery spacer (212) for holding said plurality of base batteries (211) in parallel to each other; a plurality of pairs of lead plates (220) each of which connect the end surfaces of said base batteries (211) held by said battery spacer (212) in corresponding one of the battery blocks (210) so that the base batteries (211) are connected to each other in parallel, and one of one pair of the lead plates (220) in one battery block (210) is serially connected to one of one pair of the lead plates (220) in another battery block (210) adjacent to the one battery block (210); a circuit board (240) that is electrically connected to said plurality of pairs of lead plates (220); and an exterior case (230) that accommodates said battery blocks (210) and the circuit board (240), characterized in that said battery blocks (210) are classified into battery block rows (202) in that the classified battery blocks (210) are arranged side by side in parallel to each other so that the end surfaces of the base batteries (211) included in the battery blocks (210) are arranged coplanar with each other, wherein said battery block rows (202) are arranged side by side so that the end surfaces of said base batteries (211) of said battery block rows (202) are opposed to each other and so that said base batteries (211) of said battery block rows (202) are aligned in substantially straight lines and extend in the center axes of cylindrical shapes whereby composing a battery assembly (201), wherein battery block rows (202) that are arranged side by side adjacent to each other include lead plate (220) extension parts that extend along the side surfaces of said battery assembly (201), and the battery pack comprises lead connection portions (225) that electrically connect the lead plate (220) extension parts to each other, wherein the lead connection portions (225) are alternately arranged on parts of the side surfaces of said battery assembly (201) between adjacent battery block rows (202) to connect said lead plates (220) to each other.

2. claims: 10-15

A battery pack comprising: a plurality of battery blocks (303); lead plates (305) that connect the plurality of battery blocks (303) to each other; and a battery core pack (310) that includes the plurality of battery blocks (303), which are connected to each other by the lead plates (305) and are arranged in a straight line, characterized in that (a) said battery block (303) includes an odd number, three or



LACK OF UNITY OF INVENTION
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

more, of parallel units (302), (b) each of the odd number of parallel units (302) includes a plurality of base batteries (301), and the odd number of parallel units (302) are coupled to each other in one row in the traverse direction in said battery block (303) so that the longitudinal directions of base batteries (301) of the odd number of parallel units (302) extend in parallel to each other, (c) each of the plurality of base batteries (301) has end surface terminals (301A) on the both ends, and the plurality of base batteries (301) are arranged into parallel to each other in said parallel unit (302) so that the base batteries (301) are connected to each other in parallel by the lead plates (305), which connect the end surface terminals (301A) on the both ends of the base batteries (301), (d) parallel units (302) adjacent to each other in each of said battery blocks (303) are serially connected to each other by lead plates (305), which connect the base batteries (301), which compose the parallel units (302), to each other in parallel, (e) lead plates (305) that are arranged on diagonal positions of said battery blocks (303) are bent at their center so that parallel units (302) of battery blocks (303) adjacent to each other are serially connected to each other by connection parts (305c) that are arranged on the both sides of a bent portion (305b) of each of the bent lead plates (305).

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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24-04-2012

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82